# CLAIMS

1. A method for encoding an audio signal that comprises:

receiving spectral components that represent spectral content of the audio signal;

applying a perceptual model to the spectral components to obtain a first masking curve that represents perceptual masking effects of the audio signal;

deriving an estimated value of a coding parameter that specifies an offset between a second masking curve and the first masking curve, wherein the estimated value of the coding parameter is derived in response to a number of bits that are available for encoding the audio signal;

obtaining an optimum value of the coding parameter by modifying the estimated value of the coding parameter in an iterative process that searches for the optimum value of the coding parameter according to the perceptual model;

generating encoded spectral components by quantizing spectral components according to the second masking curve, wherein resolution of the quantizing is responsive to the first masking curve and the coding parameter such that the optimum value of the coding parameter minimizes perceptiblity of quantizing noise according to the perceptual model; and

assembling a representation of the encoded spectral components into an output signal.

2. The method according to claim 1, wherein derivation of the estimated value of the coding parameter comprises:

selecting an initial value for the coding parameter;

determining a first number of bits in response to the initial value of the coding parameter to use in quantizing the spectral components;

determining a second number of bits from a difference between the first number of bits and a third number of bits, wherein the third number of bits corresponds to the number of bits that are available for encoding the audio signal; and

deriving the estimated value of the coding parameter in response to the initial value of the coding parameter and the second number of bits.

3. The method according to claim 1, wherein the spectral components are arranged in a plurality of blocks, the plurality of blocks being arranged in a frame of blocks, and wherein encoded spectral components are generated by quantizing at least some but not all blocks of spectral components in the frame according to the estimated value of the coding parameter.

4. A method for encoding an audio signal that comprises:

receiving spectral components that represent spectral content of the audio signal;

deriving an estimated value of a coding parameter, wherein the estimated value is an estimate of an optimum value of the coding parameter and is derived by:

selecting an initial value for the coding parameter;

determining a first number of bits in response to the initial value of the coding parameter;

determining a second number of bits from a difference between the first number of bits and a third number of bits that corresponds to a number of bits available to encode the audio signal; and

deriving the estimated value of the coding parameter in response to the initial value of the coding parameter and the second number of bits;

generating encoded spectral components by quantizing spectral components according to the coding parameter, wherein resolution of the quantizing is responsive to the coding parameter such that the optimum value of the coding parameter minimizes perceptiblity of quantizing noise according to a perceptual model; and

assembling a representation of the encoded spectral components into an output signal.

5. The method according to claim 4, wherein the spectral components are arranged in blocks and the method generates the encoded spectral components by quantizing some blocks

of spectral components according to the estimated value of the coding parameter and by quantizing other blocks of spectral components according to the optimum value of the coding parameter, wherein the optimum value of the coding parameter is obtained by performing an iterative process that searches for the optimum value of the coding parameter according to the perceptual model.

6. The method according to claim 5, wherein the iterative process searches for the optimum value of the coding process by starting with an initial value equal to the estimated value of the coding parameter.

7. A medium conveying a program of instructions that is executable by a device to perform a method for encoding an audio signal that comprises:

receiving spectral components that represent spectral content of the audio signal;

applying a perceptual model to the spectral components to obtain a first masking curve that represents perceptual masking effects of the audio signal;

deriving an estimated value of a coding parameter that specifies an offset between a second masking curve and the first masking curve, wherein the estimated value of the coding parameter is derived in response to a number of bits that are available for encoding the audio signal;

obtaining an optimum value of the coding parameter by modifying the estimated value of the coding parameter in an iterative process that searches for the optimum value of the coding parameter according to the perceptual model;

generating encoded spectral components by quantizing spectral components according to the second masking curve, wherein resolution of the quantizing is responsive to the first masking curve and the coding parameter such that the optimum value of the coding parameter minimizes perceptiblity of quantizing noise according to the perceptual model; and

assembling a representation of the encoded spectral components into an output signal.

8. The medium according to claim 7, wherein derivation of the estimated value of the coding parameter comprises:

selecting an initial value for the coding parameter;

determining a first number of bits in response to the initial value of the coding parameter to use in quantizing the spectral components;

determining a second number of bits from a difference between the first number of bits and a third number of bits, wherein the third number of bits corresponds to the number of bits that are available for encoding the audio signal; and

deriving the estimated value of the coding parameter in response to the initial value of the coding parameter and the second number of bits.

9. The medium according to claim 7, wherein the spectral components are arranged in a plurality of blocks, the plurality of blocks being arranged in a frame of blocks, and wherein encoded spectral components are generated by quantizing at least some but not all blocks of spectral components in the frame according to the estimated value of the coding parameter.

10. A medium conveying a program of instructions that is executable by a device to perform a method for encoding an audio signal that comprises:

receiving spectral components that represent spectral content of the audio signal;

deriving an estimated value of a coding parameter, wherein the estimated value is an estimate of an optimum value of the coding parameter and is derived by:

selecting an initial value for the coding parameter;

determining a first number of bits in response to the initial value of the coding parameter;

determining a second number of bits from a difference between the first number of bits and a third number of bits that corresponds to a number of bits available to encode the audio signal; and

deriving the estimated value of the coding parameter in response to the initial value of the coding parameter and the second number of bits;

generating encoded spectral components by quantizing spectral components

5      according to the coding parameter, wherein resolution of the quantizing is responsive to the coding parameter such that the optimum value of the coding parameter minimizes perceptiblity of quantizing noise according to a perceptual model; and

assembling a representation of the encoded spectral components into an output signal.

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11. The medium according to claim 10, wherein the spectral components are arranged in blocks and the method generates the encoded spectral components by quantizing some blocks of spectral components according to the estimated value of the coding parameter and by quantizing other blocks of spectral components according to the optimum value of the

15      coding parameter, wherein the optimum value of the coding parameter is obtained by performing an iterative process that searches for the optimum value of the coding parameter according to the perceptual model.

12. The medium according to claim 11, wherein the iterative process searches for the

20      optimum value of the coding process by starting with an initial value equal to the estimated value of the coding parameter.

13. An apparatus for encoding an audio signal that comprises:

(a) an input terminal;

25      (b) an output terminal; and

(c) signal processing circuitry coupled to the input terminal and the output terminal, wherein the signal processing circuitry is adapted to:

receive a signal from the input terminal and obtain therefrom spectral components that represent spectral content of the audio signal;

30      apply a perceptual model to the spectral components to obtain a first masking curve that represents perceptual masking effects of the audio signal;

derive an estimated value of a coding parameter that specifies an offset between a second masking curve and the first masking curve, wherein the estimated value of the coding parameter is derived in response to a number of bits that are available for encoding the audio signal;

5         obtain an optimum value of the coding parameter by modifying the estimated value of the coding parameter in an iterative process that searches for the optimum value of the coding parameter according to the perceptual model;

generate encoded spectral components by quantizing spectral components according to the second masking curve, wherein resolution of the quantizing is

10         responsive to the first masking curve and the coding parameter such that the optimum value of the coding parameter minimizes perceptiblity of quantizing noise according to the perceptual model; and

assemble a representation of the encoded spectral components into an output signal that is sent to the output terminal.

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14. The apparatus according to claim 13, wherein derivation of the estimated value of the coding parameter comprises:

selecting an initial value for the coding parameter;

determining a first number of bits in response to the initial value of the coding

20         parameter to use in quantizing the spectral components;

determining a second number of bits from a difference between the first number of bits and a third number of bits, wherein the third number of bits corresponds to the number of bits that are available for encoding the audio signal; and

deriving the estimated value of the coding parameter in response to the initial

25         value of the coding parameter and the second number of bits.

15. The apparatus according to claim 13, wherein the spectral components are arranged in a plurality of blocks, the plurality of blocks being arranged in a frame of blocks, and wherein encoded spectral components are generated by quantizing at least some but not

30         all blocks of spectral components in the frame according to the estimated value of the coding parameter.

16. An apparatus for encoding an audio signal that comprises:

(a) an input terminal;

(b) an output terminal; and

(c) signal processing circuitry coupled to the input terminal and the output terminal, wherein the signal processing circuitry is adapted to:

receive a signal from the input terminal and obtain therefrom spectral components that represent spectral content of the audio signal;

derive an estimated value of a coding parameter, wherein the estimated value is an estimate of an optimum value of the coding parameter and is derived by:

selecting an initial value for the coding parameter;

determining a first number of bits in response to the initial value of the coding parameter;

determining a second number of bits from a difference between the first number of bits and a third number of bits that corresponds to a number of bits available to encode the audio signal; and

deriving the estimated value of the coding parameter in response to the initial value of the coding parameter and the second number of bits;

generate encoded spectral components by quantizing spectral components according to the coding parameter, wherein resolution of the quantizing is responsive to the coding parameter such that the optimum value of the coding parameter minimizes perceptiblity of quantizing noise according to a perceptual model; and

assemble a representation of the encoded spectral components into an output signal.

17. The apparatus according to claim 16, wherein the spectral components are arranged in blocks and the method generates the encoded spectral components by quantizing some blocks of spectral components according to the estimated value of the coding parameter and by quantizing other blocks of spectral components according to the optimum value of the coding parameter, wherein the optimum value of the coding parameter is obtained by

performing an iterative process that searches for the optimum value of the coding parameter according to the perceptual model.

18. The apparatus according to claim 17, wherein the iterative process searches for the optimum value of the coding process by starting with an initial value equal to the estimated value of the coding parameter.